Space Weather Forecast

Issued on Wednesday, 17 January 2024 at 12:46 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate-class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with only minor Common class flares. There are fourteen sunspots on the disc, however these are all relatively small and simple or mature regions. The most notable development was with an emergent spot near the southwest, however this and also two nearby spots are increasingly difficult to assess and soon moving off the disc. A small, new region rotated on the northeast limb, but any analysis of this also remains difficult. Any other development on the disc, including around the slightly larger spots AR3545 in the west, AR3549 in the south-centre and AR3553 in the northeast, remained limited.

No Earth-directed CMEs were observed.

Solar Wind / Geomagnetic Activity: Slow wind conditions persisted, with speeds observed by ACE and DSCOVR at background to slightly elevated 350-450km/s, although DSCOVR is likely over-estimating the peak values. The interplanetary magnetic field (IMF) has been weak throughout. The north-south component was weak but mainly negative (southward). Geomagnetic activity was Quiet (Kp 0-1).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels, with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a chance of isolated Moderate-class activity.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Transition into the faster winds from a coronal hole is expected later day 1 (17 Jan), then easing later day 2-3 (18-19 Jan). Further slight enhancement then possible day 4 (20 Jan) from the fast winds of a further coronal hole. Only limited enhancements are expected, with solar winds peaking slightly elevated, around 450km/s. Generally Quiet geomagnetic activity is expected, however onset of the fast winds will likely bring a spell of Unsettled (Kp3) with a chance of an isolated Active interval (Kp4), mostly likely late day 1 (17 Jan) or day 4 (20 Jan).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background levels, with only a very slight chance of solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	35	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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